

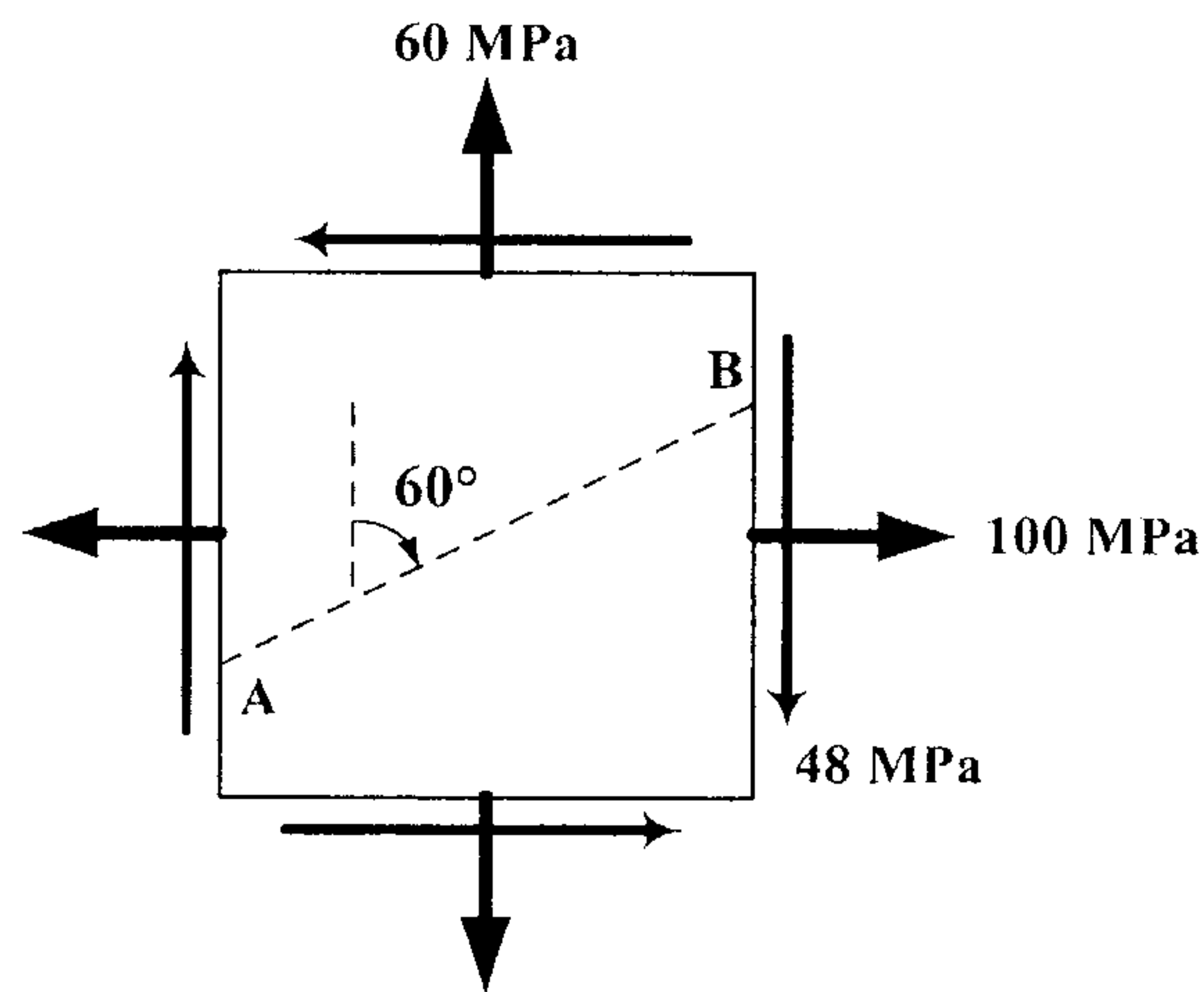
國立清華大學 102 學年度碩士班考試入學試題

系所班組別：工程與系統科學系碩士班 乙組

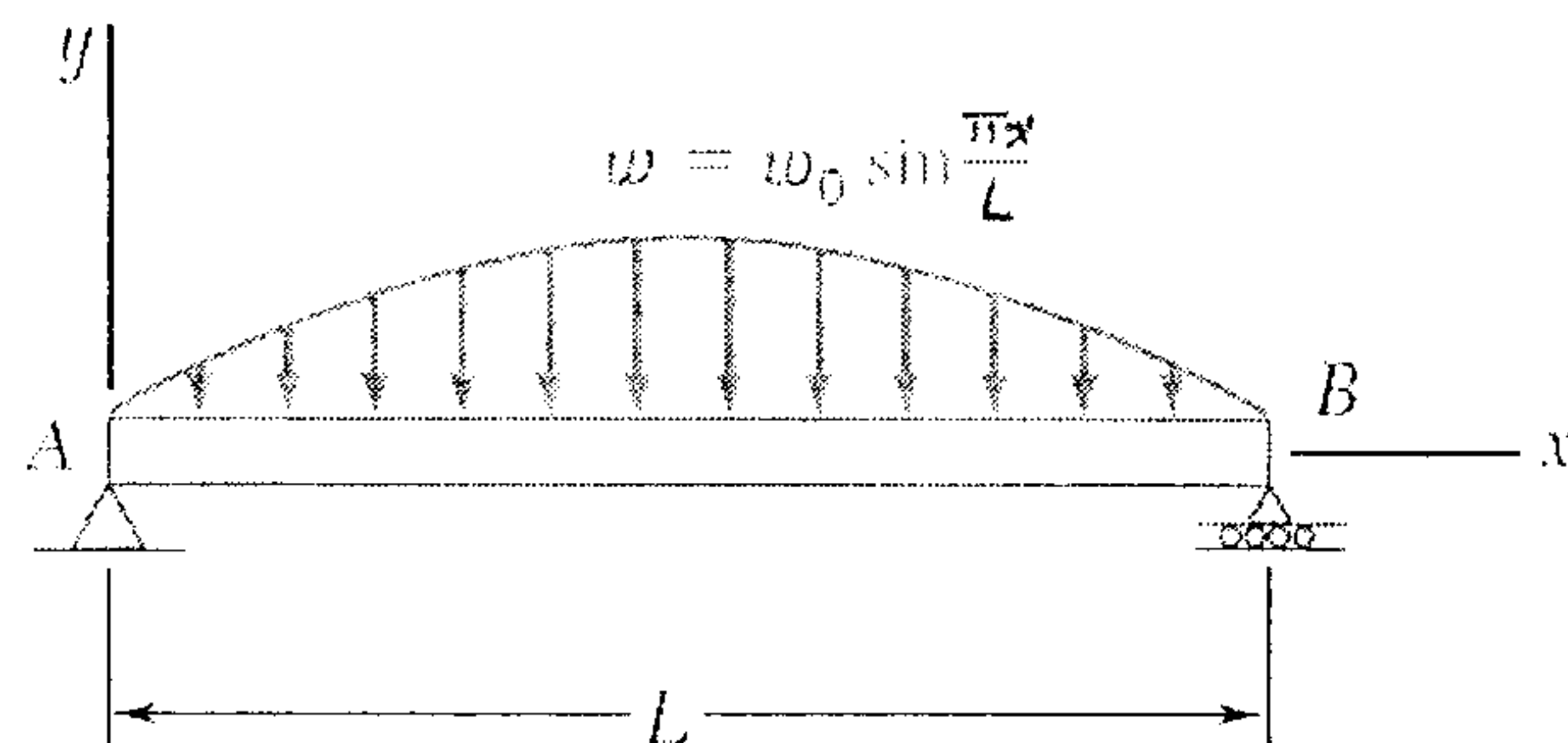
考試科目（代碼）：工程力學（含靜力學、材料力學）（2605）

共 3 頁，第 1 頁 \*請在【答案卷、卡】作答

1. For the state of plane stress shown, determine (a) the principle planes and the principle stresses (12%), (b) the stress components exerted on the element obtained by rotating the given element counterclockwise through  $30^\circ$  (8%)



2. For the beam and loading shown, determine
- (a) The equation of the elastic curve. (10%)
  - (b) The slope at end A. (5%)
  - (c) The maximum deflection. (5%)



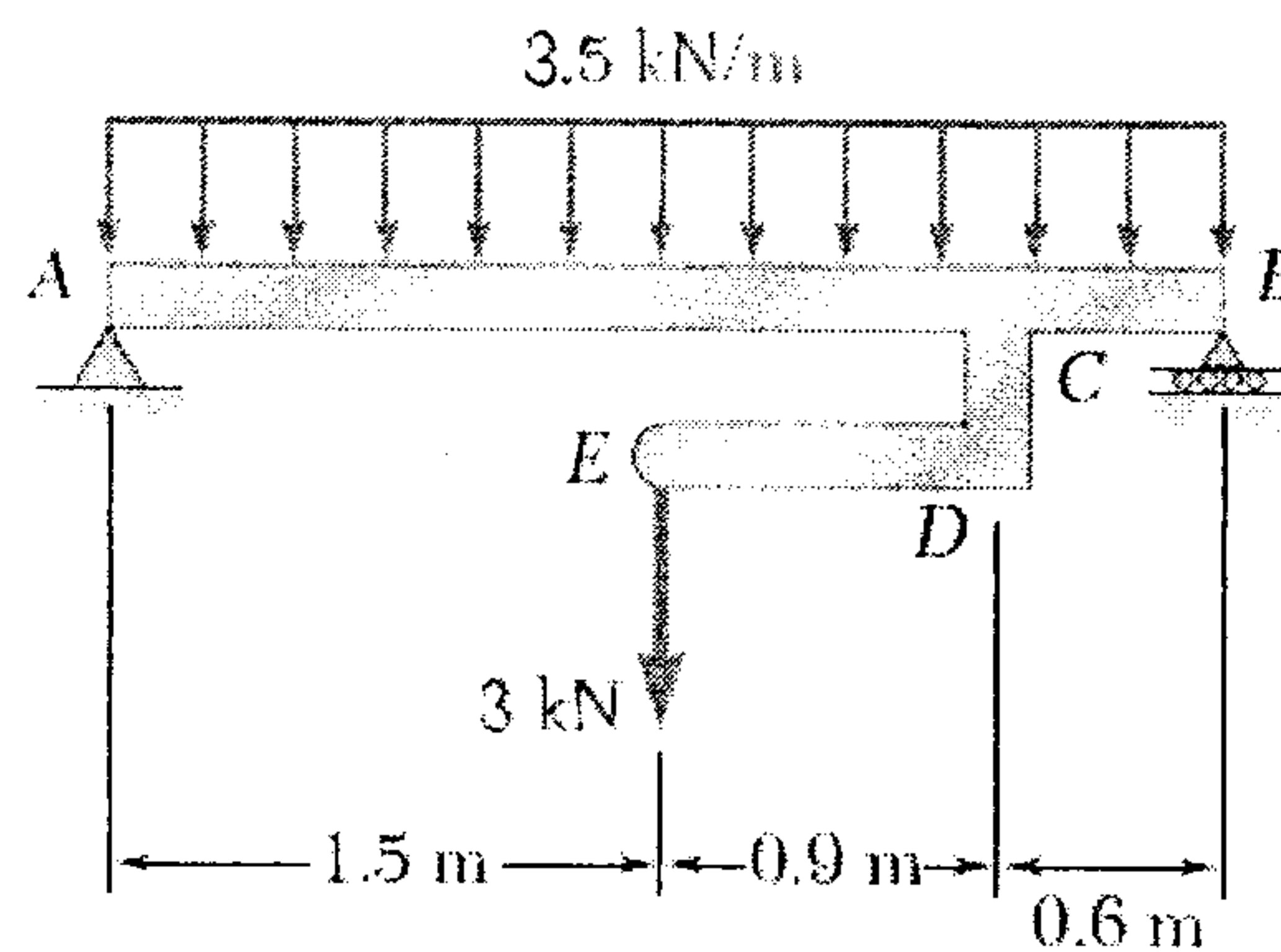
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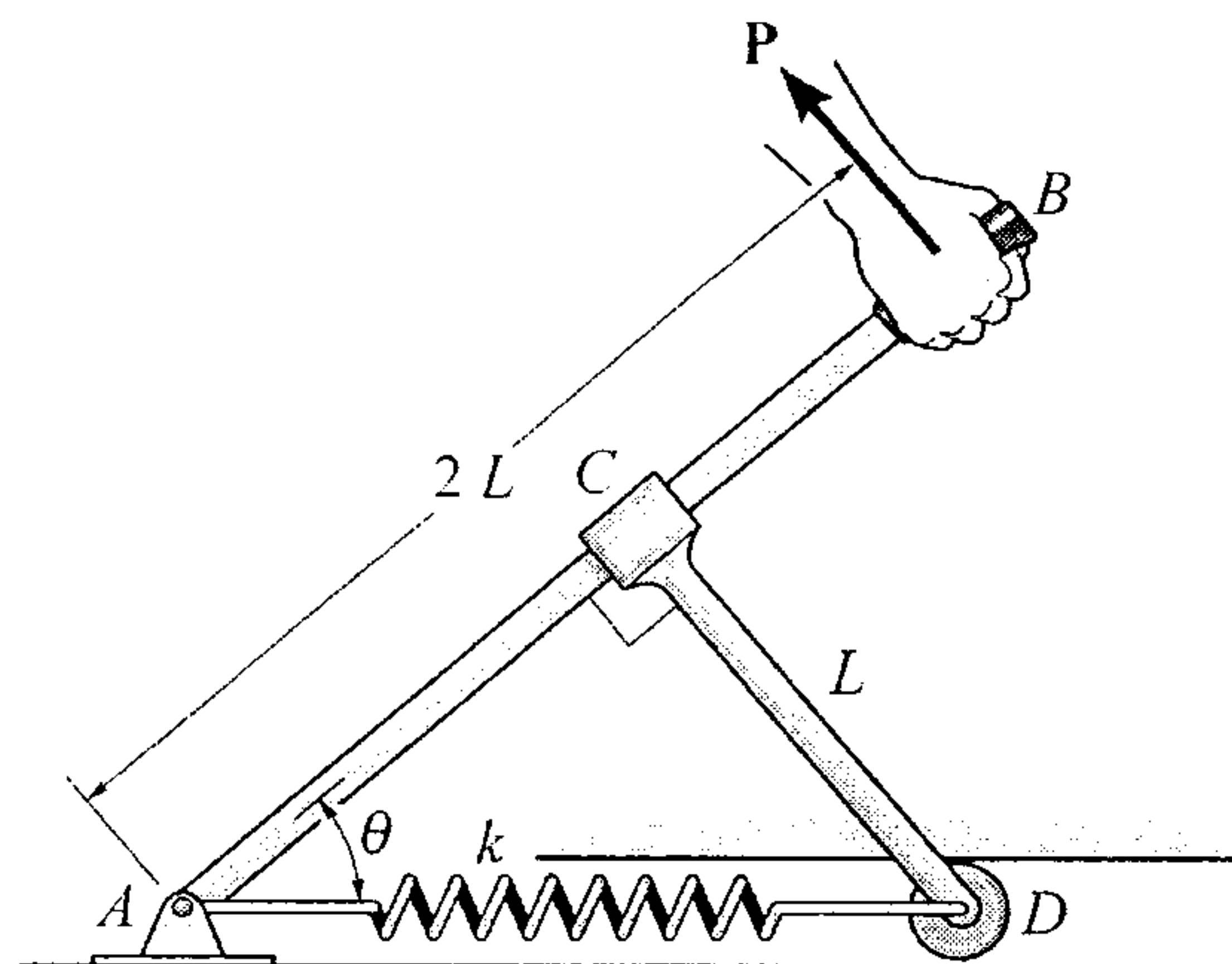
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共 3 頁，第 2 頁 \*請在【答案卷、卡】作答

3. Draw the shear and bending-moment diagrams for the beam and loading shown, and determine the maximum absolute value (a) of the shear, (b) of the bending moment. (20%)



4. The two-bar mechanism consists of a lever arm AB and smooth link CD, which has a fixed collar at its end C and a roller at the other end D. Determine the force P needed to hold the lever in the position  $\theta$ . The spring has a stiffness  $k$  and unstretched length  $2L$ . The roller contacts either the top or bottom portion of the horizontal guide. (20%)



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5. For the beam and loading shown, consider section n-n and determine the shearing stress at (a) point a, (b) point b. (20%)

